Federal Transition Framework Metamodel Reference

Pilot Version

June 2006

Revision History

Date	Version	Approver	Summary of changes
June 2006	Pilot	Dick Burk	Initial version

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1 Introduction

1.1 OVERVIEW

The Federal Transition Framework (FTF) provides clear and consistent information to describe government-wide IT policy objectives and cross-agency initiatives.

The FTF does not create IT policy. It provides a simple structure to organize and publish existing information to:

- Enhance the quality and consistency of information on cross-agency initiatives
- Increase the level and speed of adoption of cross-agency initiatives
- Improve the overall effectiveness and efficiency of IT investments and programs related to cross-agency initiatives.

1.2 ABOUT THE FTF PACKAGE

Three documents are provided to describe the content and structure of the Federal Transition Framework and how it should be used:

- **FTF Usage Guide**: Provides guidance to agency decision-makers and cross-agency stakeholders on how to apply and extend the FTF. This is the first document to read when starting to learn about the FTF and how it should be used.
- **FTF Catalog**: Provides a written description and information references for cross-agency initiatives included in the FTF.
- **FTF Metamodel Reference**: Provides information on the internal structure of the FTF. This document is provided as a technical reference for architects.

1.3 ABOUT THIS DOCUMENT

This document is a companion to the FTF Catalog. The Metamodel Reference describes the structure of the FTF, including the types of information contained within the FTF and the relationships among these types. These structural aspects of the FTF are known as a metamodel. This document is intended to be used by agency enterprise architects who are responsible for integrating their agency's target enterprise architecture with the FTF, and by tool vendors who intend to integrate FTF content into their EA repository and modeling products.

This document is organized into the following sections:

- **Metamodel Overview:** This section introduces key concepts associated with the FTF metamodel, provides an overview of the metamodel layers and explains the idea behind FTF Cross-Agency Initiatives (CAIs).
- **FTF Model Elements by Layer:** This section describes each metamodel element in detail. This includes all entity types, type attributes, and relationships. These elements are grouped logically into metamodel layers.
- **Documenting the FTF Metamodel:** This appendix explains the conventions used to document the metamodel, including UML notation

1.4 FTF CONTACT INFORMATION

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2 Metamodel Overview

2.1 KEY METAMODEL CONCEPTS

In order to best understand this document, it is important to understand some of the key concepts of enterprise architecture modeling.

The **metamodel** defines the kinds of information recorded in the Federal Transition Framework. The kinds of data the metamodel describes are called **entity types**. Entity types are analogous to tables in database theory or to classes in object-oriented theory. Conceptually related entity types are grouped together into **layers**, which are described in further detail below.

An entity type represents an important concept or abstraction of the enterprise architecture; they are the "nouns". Each entity type contains one or more **attributes** describing the entity. Further, each entity type may be conceptually linked to one or more other entity types in a **relationship** of some kind. The entity types, attributes, and relationships can be represented in graphical notation using the Unified Modeling Language, as we have done in section 3 below. A brief overview of UML notation is provided as Appendix A to this document.

2.2 FTF CROSS-AGENCY INITIATIVES (CAIS)

It is important to note the FTF (at least in its initial release) does not claim to be a comprehensive representation of all common architecture elements across the Federal government. Instead, the FTF's primary focus is in organizing elements of federal cross-agency initiatives into a single, consistent and reusable architectural framework. In this first release of the FTF, cross-agency initiatives (CAIs) are:

- Internet Protocol Version 6 Transition Initiative
- IT Infrastructure Optimization Line of Business
- E-Authentication Service Component

Additional CAIs will be incorporated into subsequent releases of the FTF.

2.3 FTF LAYERS

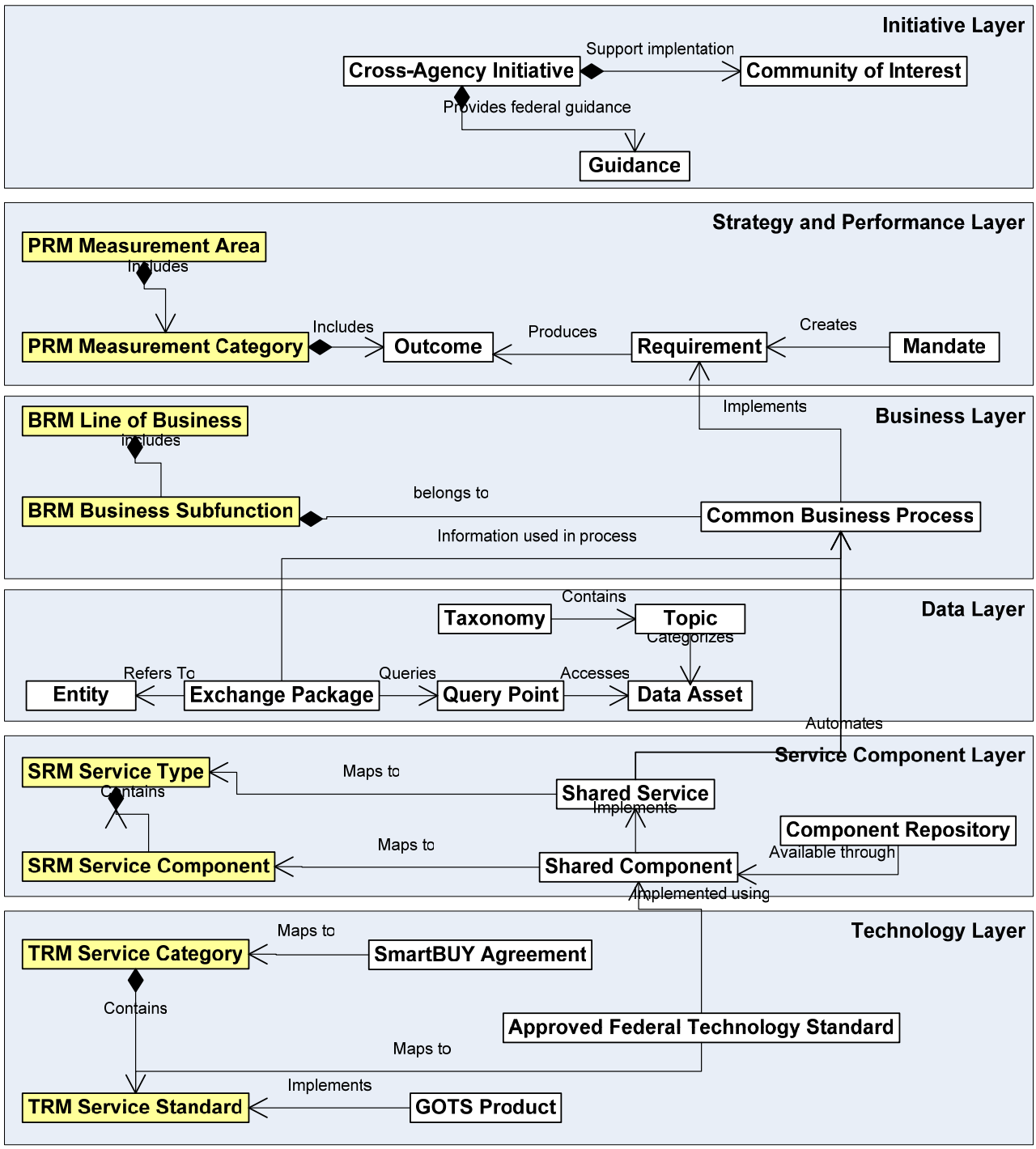
A common characteristic of many enterprise architecture frameworks is they are organized into layers, or perspectives. The Federal Enterprise Architecture Framework Reference Models defines five layers of an enterprise architecture (Performance, Business, Data, Service Component, and Technology). In addition to the five Reference Model layers, the design of the FTF also incorporates the idea of EA Cross-Agency Initiatives, described in the previous section. As such, the FTF has six layers:

- **Initiative:** Describes a specific federal cross-agency initiative represented in the FTF, including approved implementation guidance for agencies and any communities of interest supporting the CAI.

- **Strategy and Performance:** Describes the outcomes, objectives and mandates representing the strategic goals of a given CAI, aligned to the FEA Performance Reference Model
- **Business:** Describes the common business processes and initiatives specific to the CAI, aligned to the FEA Business Reference Model
- **Data:** Describes the common information exchange packages, data repositories and standards of a given CAI, which are structured using the framework of the FEA Data Reference Model (version 2.0)
- **Service Component:** Describes the common shared IT services, components and component repositories specific to a given CAI, aligned to the FEA Service Component Reference Model
- **Technology:** Describes the common technology standards, government off-the-shelf products and shared licensing opportunities specific to a given CAI, aligned to the FEA Technical Reference Model

The following diagram provides an overview of the relationships among the layers, and the entity types existing within each layer. The layers are organized from top to bottom in the order described above.

Figure 1: The Federal Transition Framework



2.4 COMMON OBJECT ATTRIBUTES

There is a set of entity attributes common to all entity types in the FTF. These attributes are:

Attribute	Type	Description
Name	String	Instance name. Should be brief and natural, and it should uniquely identify the entity instance.
Description	String	Brief description of the entity instance
URL	String	Internet Uniform Resource Locator that provides additional information pertinent to a specific object within the FTF.

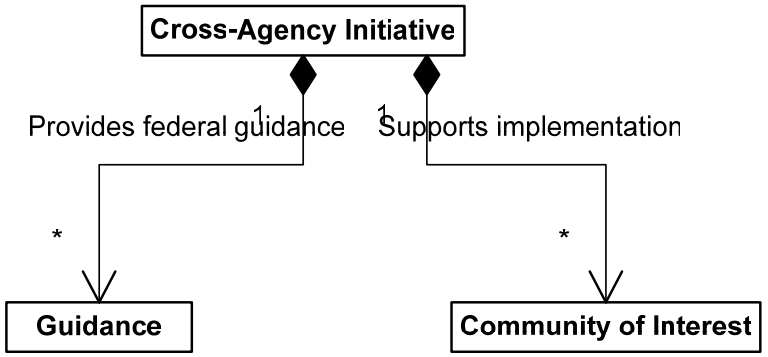
The common attributes will not be repeated in the descriptions unless there is a special provision for how the attribute is used with a particular entity.

3 FTF Metamodel Elements By Layer

3.1 INITIATIVE LAYER

The Initiative Layer describes important elements of common federal cross-agency initiatives including:

- The initiatives themselves
- Relevant sources of federal guidance
- Communities of interest within the Federal government providing support to agencies implementing the initiative



Entity Name	Cross-Agency Initiative (CAI)	
Entity Description	Describes a common federal initiative or IT management requirement	
Examples	IPv6, IT Infrastructure Optimization LOB, Grants LOB, e-Authentication Service Component	
Entity Source	OMB	
Unique Attributes	**Type**	**Description**
Mandatory / Informational	True/False	Agencies are expected to incorporate the FTF Catalog content for all CAIs designated as Mandatory, providing that the CAI is relevant to the agency's lines of business (see "Applicable Agencies"), below. Non-Mandatory CAIs are designated as Informational, meaning that agencies may elect to incorporate the FTF content for that CAI into their target architectures, but are not required to do so.
Applicable Agencies	String	Describes criteria to determine which federal agencies this initiative applies to
Managing Partner	String	Name of agency responsible for managing the cross-agency initiative

Entity Name	Guidance

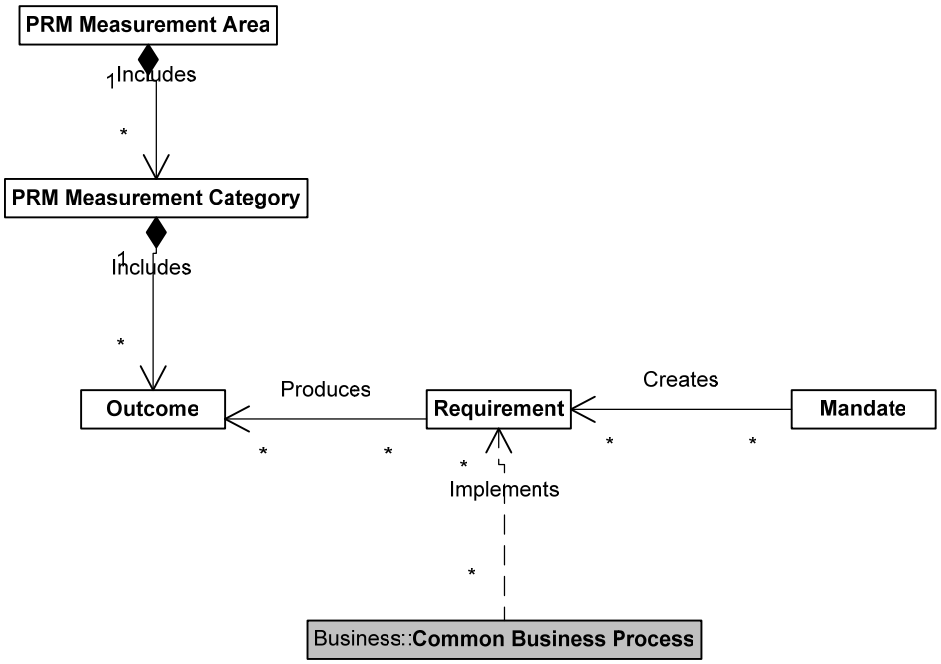
Entity Description	Document(s) that provide approved federal guidance to federal agencies in implementing the CAI. The source of this guidance may be OMB, the CIO Council or other designated agencies or bodies.	
Examples	"Integrating IPv6 into Agency EA Planning" (pub. by the CIO Council)	
Entity Source	OMB, CIO Council	
Unique Attributes	**Type**	**Description**
Author	String	Organization responsible for producing guidance

Entity Name	Community of Interest	
Entity Description	Group established within the Federal government to promote and support implementation efforts for this CAI by Federal agencies	
Examples	AIC IPv6 Working Group	
Entity Source	Any Federal agency	
Unique Attributes	**Type**	**Description**
Contact Name	String	Individual contact for community
Contact E-Mail	String	E-mail address of contact

3.2 STRATEGY AND PERFORMANCE LAYER

The Strategy and Performance Layer describes important elements of CAIs including:

- Federal mandates for IT management and specific agency requirements associated with them
- Expected performance outcomes for the initiative, linked to the FEA Performance Reference Model



Entity Name	PRM Measurement Area
Entity Description	Provides general groupings of measurement indicators within the

	Performance Reference Model (PRM)	
Examples	Mission and Business Results Measurement Area	
Entity Source	FEA Consolidated Reference Model	
Unique Attributes	**Type**	**Description**
No additional attributes		

Entity Name	PRM Measurement Category	
Entity Description	Provides general classifications of measurement indicators within the Performance Reference Model (PRM)	
Examples	Community and Social Services, Defense and National Security	
Entity Source	FEA Consolidated Reference Model	
Unique Attributes	**Type**	**Description**
No additional attributes		

Entity Name	Outcome	
Entity Description	Measurable agency performance outcome expected as a result of initiative. Performance improvements may be in the areas of business process improvements, cost savings and cost avoidance, technology implementation or other measures as enumerated within the PRM.	
Examples	"25% improvement in vaccination delivery schedule"	
Entity Source	Cross-Agency Initiative Managing Partner	
Unique Attributes	**Type**	**Description**
No additional attributes		

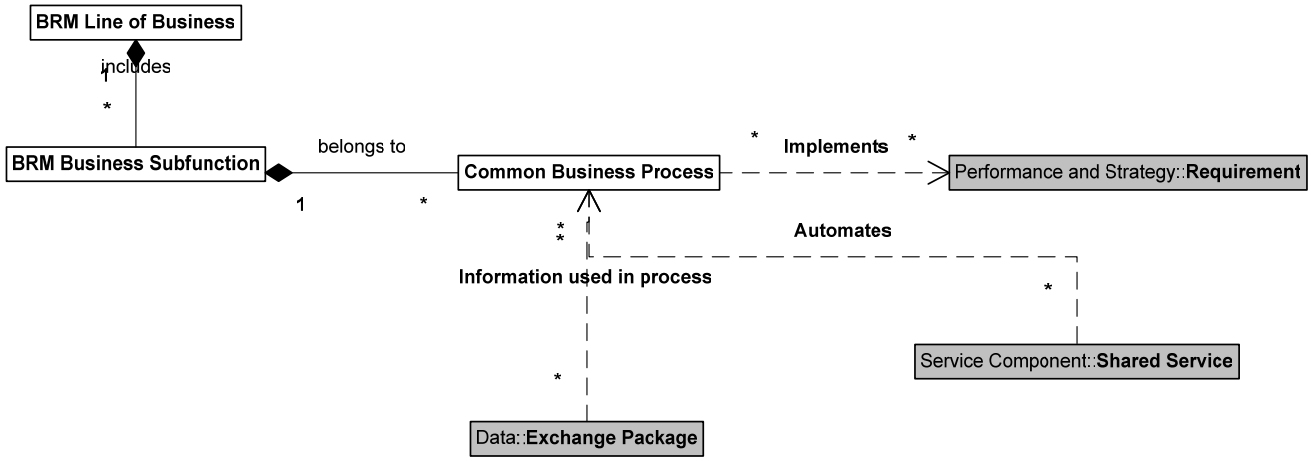
Entity Name	Mandate	
Entity Description	Federal legislation or administrative directive that serves a source for compliance requirements for Federal agencies	
Examples	E-Government Act, OMB Memorandum 05-22	
Entity Source	OMB, Congress, Policy Authority	
Unique Attributes	**Type**	**Description**
Type	String	Indicates whether mandate is legislation or administrative directive

Entity Name	Requirement	
Entity Description	Specific agency requirement for compliance with this initiative that derives from a Mandate (see above). A Requirement describes a specific, measurable expectation for agency conformance.	
Examples	"…all agencies' infrastructure (network backbones) must be using IPv6, and agency networks must interface with this infrastructure, by June 30, 2008."	
Entity Source	OMB, Congress, Policy Authority	
Unique Attributes	**Type**	**Description**
Requirement Source	String	Mandate instituting the requirement

3.3 BUSINESS LAYER

The Business Layer encompasses entities and relationships pertaining to cross-agency business activities, including:

- Common cross-agency business processes defined by the CAI for their line of business
- Linkage to the FEA Business Reference Model
- Linkage to related strategic requirements, service components and information exchange packages



Entity Name	BRM Line of Business	
Entity Description	Provides a description of specific governmental lines of business	
Examples	Health, Homeland Security	
Entity Source	FEA Consolidated Reference Model	
Unique Attributes	**Type**	**Description**
Number	Integer	Unique identity code assigned by FEA to each line of business

Entity Name	BRM Business Subfunction
Entity Description	Breaks a line of business down into smaller, more concrete functions
Examples	Public Relations, Record Retention
Entity Source	FEA Consolidated Reference Model

Unique Attributes	Type	Description
Number	Integer	Unique identity code assigned by FEA to each subfunction

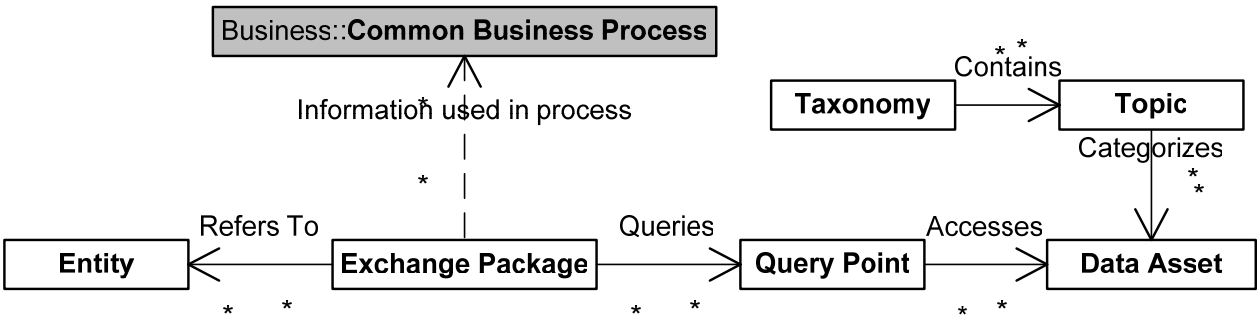
Entity Name	Common Business Process	
Entity Description	A business process is an activity performed by agencies that yields a result of measurable value to one or more stakeholders. Each BRM Business Subfunction can be further decomposed into multiple business processes	
Examples	"IPv6 Address Space Acquisition"	
Entity Source	Cross-Agency Initiative Task Force	
Unique Attributes	**Type**	**Description**
Process Owner	String	Agency formally charged with ownership of the common process

3.4 DATA LAYER

The Data layer encompasses entities and relationships pertaining to data exchanged as part of a common business process, including

- Information exchange packages defining the format for data sharing
- Data resources such as databases containing common federal data
- Data taxonomies for this cross-agency initiative

All of the entity types defined within the FTF Data Layer are defined within the FEA Data Reference Model 2.0. The entity type descriptions and attributes are taken directly from the DRM.



Entity Name	Taxonomy	
Entity Description	A collection of controlled vocabulary terms organized into a hierarchical structure. Taxonomies provide a means for categorizing or classifying information within a reasonably well-defined associative structure. Each term in a taxonomy is in one or more parent/child (broader/narrower) relationships to other terms.	
Examples	A taxonomy expressed in W3C Web Ontology Language (OWL) format.	
Entity Source	FEA Data Reference Model 2.0	
Unique Attributes	**Type**	**Description**
No additional attributes		

Entity Name	Topic	
Entity Description	A category within a Taxonomy. A Topic is the central concept for applying context to data. For example, an agency may have a Taxonomy representing their organizational structure. In such a Taxonomy, each role in the organizational structure (e.g. CIO) represents a Topic. Topic is often synonymous with “node”.	
Examples	Country	
Entity Source	FEA Data Reference Model 2.0	
Unique Attributes	**Type**	**Description**
No additional attributes		

Entity Name	Data Asset	
Entity Description	A managed container for data. In many cases, this will be a relational database; however, a Data Asset may also be a Web site, a document repository, directory or data service.	
Examples	Relational databases, semi-structured data files, unstructured documents	
Entity Source	FEA Data Reference Model 2.0	
Unique Attributes	**Type**	**Description**
Type	String	Type of Data Asset – e.g. database, Web site, registry, directory, data service, etc.
Geospatial Enabled	True/False	Designates whether or not the Data Asset supports or provides Geospatial data.

Entity Name	Query Point	
Entity Description	An endpoint providing an interface for accessing and querying a Data Asset. A concrete representation of a Query Point may be a specific URL at which a query Web Service may be invoked. A Query Point returns a result set specified in an Exchange Package.	
Examples	"http://www.example.com/querypoint3"	
Entity Source	FEA Data Reference Model 2.0	
Unique Attributes	**Type**	**Description**
Query Languages	String	A stipulation of the query languages supported by a Query Point (e.g. SQL-92, CQL (Z39.50), XQuery, HTTP GET, etc.).

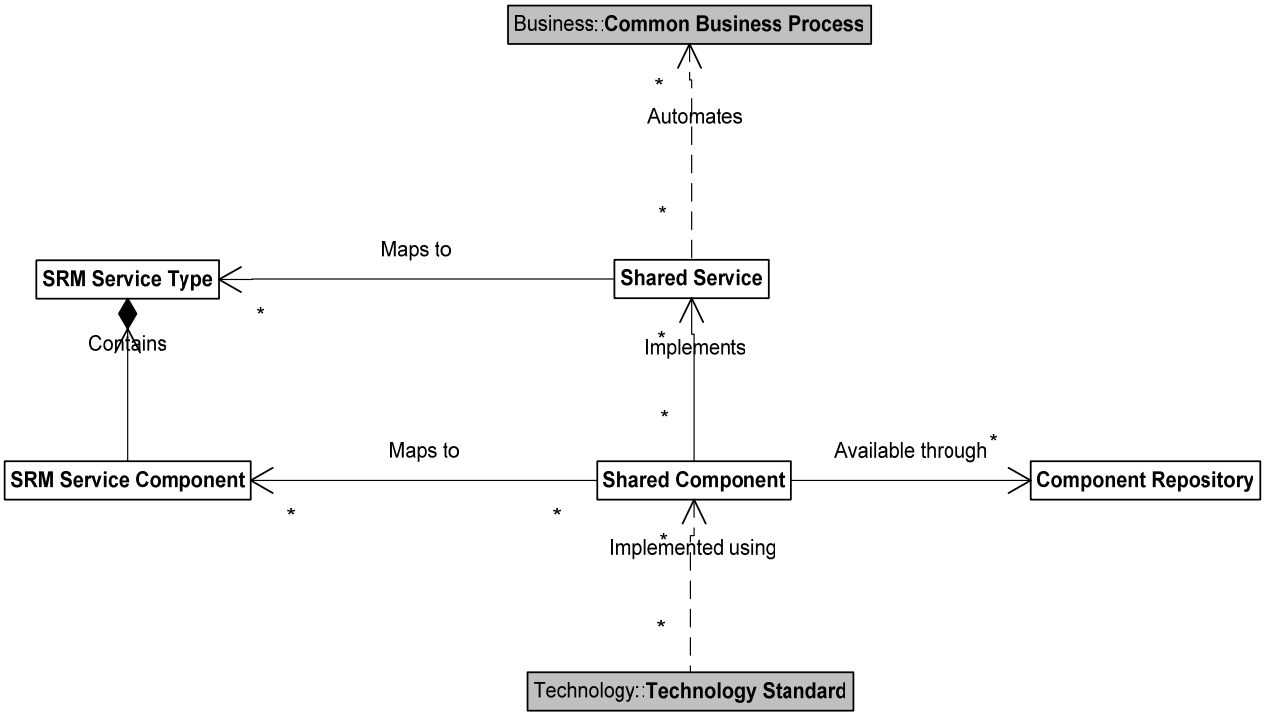
Entity Name	Exchange Package	
Entity Description	A description of a specific recurring data exchange between a supplier and a consumer. An Exchange Package contains information (metadata) relating to the exchange (such as Supplier ID, Consumer ID, validity period for data, etc.), as well as a reference to the Payload (message content) for the exchange. An Exchange Package can also be used to define the result format for a query accepted and processed by a Query Point in a data sharing scenario.	
Examples	Electronic Healthcare Record	
Entity Source	FEA Data Reference Model 2.0	
Unique Attributes	**Type**	**Description**
Classification	String	The security classification for an Exchange Package.
Frequency	String	The frequency at which the exchange occurs

Entity Name	Entity	
Entity Description	An abstraction for a person, place, object, event, or concept described (or characterized) by common Attributes. For example, "Person" and "Agency" are Entities. An instance of an Entity represents one particular occurrence of the Entity, such as a specific person or a specific agency.	
Examples	Person, Agency	
Entity Source	FEA Data Reference Model 2.0	
Unique Attributes	**Type**	**Description**
No additional attributes		

3.5 SERVICE COMPONENT LAYER

The Service Component Layer encompasses entities and relationships pertaining to shared IT services and components utilized by the CAI, including

- Shared IT services (e.g., Grants.gov)
- Potentially shareable service components (e.g., e-Authentication)
- Relevant Federal repositories of components for this CAI (e.g., Core.gov)



Entity Name	SRM Service Type	
Entity Description	Defines the second level of detail describign a business-oriented service	
Examples	Tracking and Workflow, Routing and Scheduling	
Entity Source	FEA Consolidated Reference Model	
Unique Attributes	**Type**	**Description**
No additional attributes		

Entity Name	SRM Service Component	
Entity Description	A self contained business process or service with predetermined functionality exposed through a business or technology interface	
Examples	Process Tracking, Case Management, Conflict Resolution	
Entity Source	FEA Consolidated Reference Model	
Unique Attributes	**Type**	**Description**
No additional attributes		

Entity Name	Shared Service	
Entity Description	Shared services are federal e-government implementations such as Line of Business Centers of Excellence or other services shared across multiple agencies	
Examples	HR Centers of Excellence	
Entity Source	Line of Business or E-Government Initiative	
Unique Attributes	**Type**	**Description**
Service Level Agreements	String	Description of service level agreements established for this service
Service Provider	String	Name of organization providing the shared service

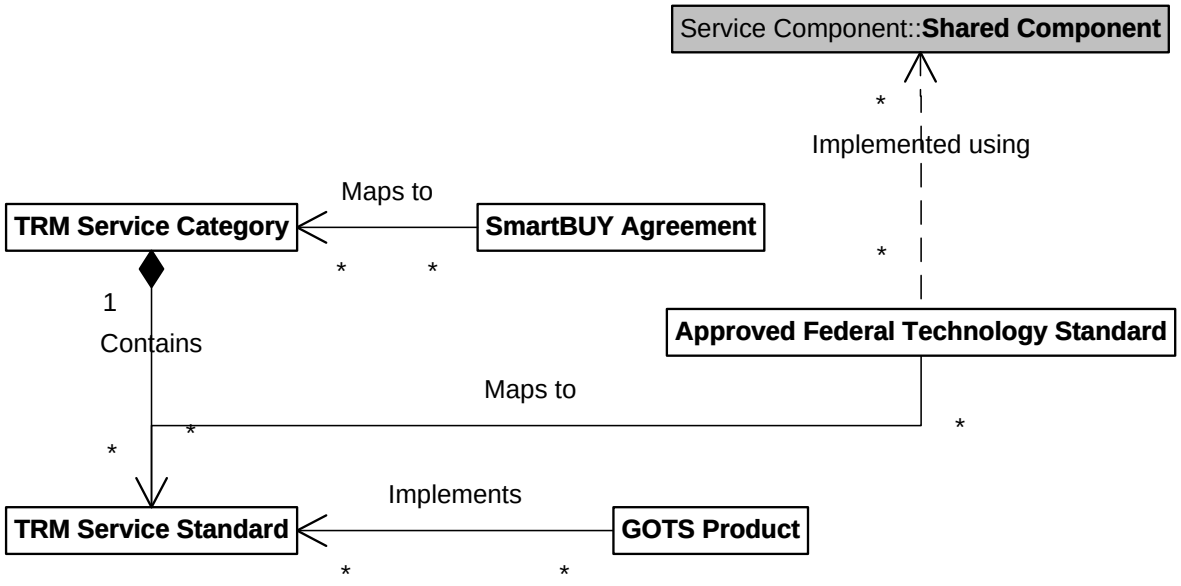
Entity Name	Shared Component	
Entity Description	Logical “building blocks” of a shared service	
Examples	e-Authentication	
Entity Source	Line of Business or E-Government Initiative	
Unique Attributes	Type	Description
No additional attributes		

Entity Name	Component Repository	
Entity Description	Online service hosting components for reuse by federal agencies	
Examples	CORE.gov	
Entity Source	Line of Business or E-Government Initiative	
Unique Attributes	Type	Description
No additional attributes		

3.6 TECHNOLOGY LAYER

The Technology Layer encompasses entities and relationships pertaining to common Federal technology infrastructure elements, including:

- Technology specifications, including NIST standards and approved industry standards
- Government off-the-shelf (GOTS) applications
- Approved SmartBUY licensing agreements for this CAI



Entity Name	TRM Service Category
Entity Description	Used to classify lower levels of technologies, standards, and specifications in respect to the business or technology function they serve
Examples	Access Channels, Service Transport

Entity Source	FEA Consolidated Reference Model	
Unique Attributes	**Type**	**Description**
No additional attributes		

Entity Name	TRM Service Standard	
Entity Description	Used to define the standards and technologies supporting the Service Category	
Examples	Web Browser, Wireless/PDA	
Entity Source	FEA Consolidated Reference Model	
Unique Attributes	**Type**	**Description**
No additional attributes		

Entity Name	Approved Federal Technology Standard	
Entity Description	Approved federal technologies, standards, and specifications in respect to the business or technology function they serve	
Examples	NIST Standards, Voluntary Consensus Standards	
Entity Source	OMB	
Unique Attributes	**Type**	**Description**
No additional attributes		

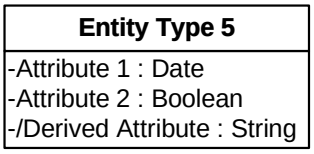
Entity Name	GOTS Product	
Entity Description	Government off-the-shelf technology products agencies can utilize without the payment of license fees. Note: the inclusion of a GOTS product within the FTF does not mandate agencies adopt this product or prefer it to a commercial product (unless otherwise specified); it merely indicates a product is available for usage by agencies should they elect to do so	
Examples	e-CPIC	
Entity Source	Any Federal agency	
Unique Attributes	**Type**	**Description**
Contact Name	String	Individual contact for product
Contact E-Mail	String	E-mail address of contact

Entity Name	SmartBUY Agreement	
Entity Description	Government-wide blanket purchase agreement for specific vendors approved under the OMB SmartBUY program	
Examples	Prosight, Oracle	
Entity Source	OMB	
Unique Attributes	**Type**	**Description**
Contact Name	String	Individual contact for agreement
Contact E-Mail	String	E-mail address of contact

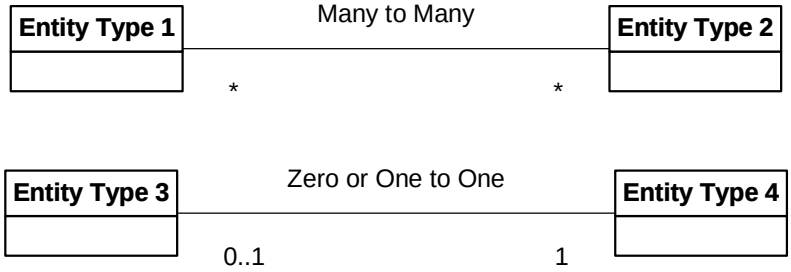
Appendix A: Documenting the FTF Metamodel

The metamodel diagrams below follow Unified Modeling Language (UML) standard. Here are a few notes on the UML notation.

- Entity types (classes) are shown as rectangles. Attributes are listed inside the rectangles.



- Relations (associations) are shown as lines; Relationship multiplicity, i.e., one-to-many, many-to-many, etc. is shown with a cardinality symbol at each end of a relationship. Cardinality can be shown as a range ("0..1"), a number ("1"), or as "*" meaning "0 or many".



- An aggregation is a one-to-many relationship. It uses the symbol of a line with a diamond in the aggregate end. A black diamond represents containment which is a strict "part-of" relationship. An open diamond is the general aggregation, which allows aggregates to share elements.